

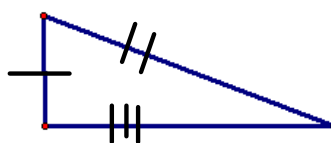
4-1 Classifying Triangles

- By Sides
- By Angles

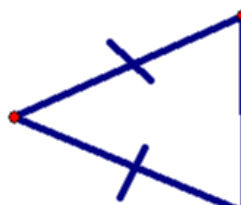
Nov 13-7:32 AM

By Sides

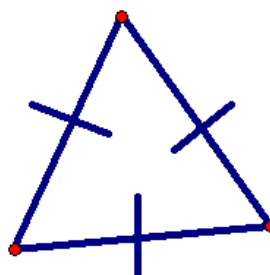
- Scalene
- No congruent sides



- Isosceles
- 2 congruent sides



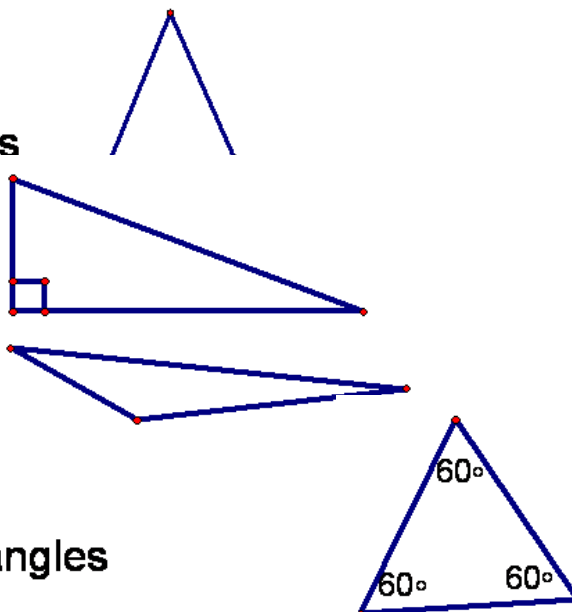
- Equilateral
- 3 congruent sides



Nov 13-7:32 AM

By Angles

- Acute
 - 3 acute angles
- Right
 - 1 right angle
- Obtuse
 - 1 obtuse ang
- Equiangular
 - 3 congruent angles



Nov 14-9:52 AM

Example

Classify the triangle by sides.

$\triangle ABC$ A(-5, -2) B(1, 4) C(1, -2)

$$D = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$AB = \sqrt{(-5-1)^2 + (-2-4)^2} = \sqrt{72}$$

36 + 36

$$BC = \sqrt{(1-1)^2 + (4-(-2))^2} = \sqrt{36}$$

0 36

$$CA = \sqrt{(1-(-5))^2 + (-2-(-2))^2} = \sqrt{36}$$

Isosceles \triangle

Nov 14-9:54 AM

Example

Classify the triangle by sides.

$\triangle AMY$ A(-3, 4) M(3, 1) Y(0, -2)

$$AM = \sqrt{45}$$

$$MY = \sqrt{18}$$

$$AY = \sqrt{45}$$

isosceles

Nov 14-9:56 AM

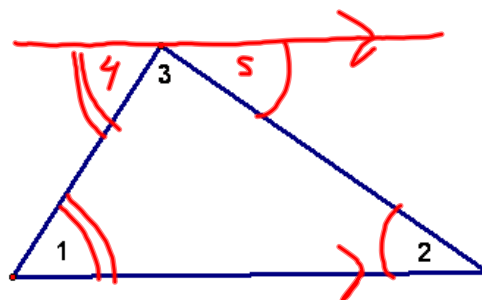
4-2 Angles of a Triangle

Theorem 4.1—Angle Sum

Theorem—the sum of the measures of the angles of a triangle is 180 degrees

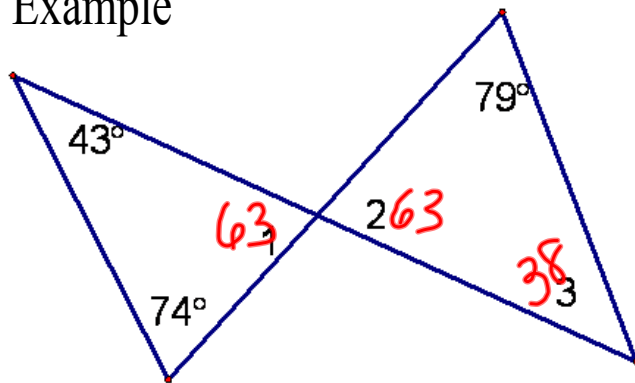
$$m\angle 1 + m\angle 2 + m\angle 3 = 180$$

$$m\angle 4 + m\angle 3 + m\angle 5 = 180$$



Nov 14-9:56 AM

Example



$$m\angle 1 + 43 + 74 = 180$$

$$m\angle 1 = 63$$

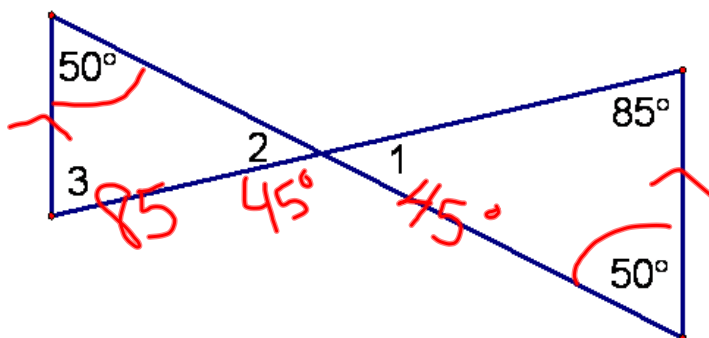
$$m\angle 1 = 63$$

$$m\angle 3 + 63 + 79 = 180$$

$$m\angle 3 = 38$$

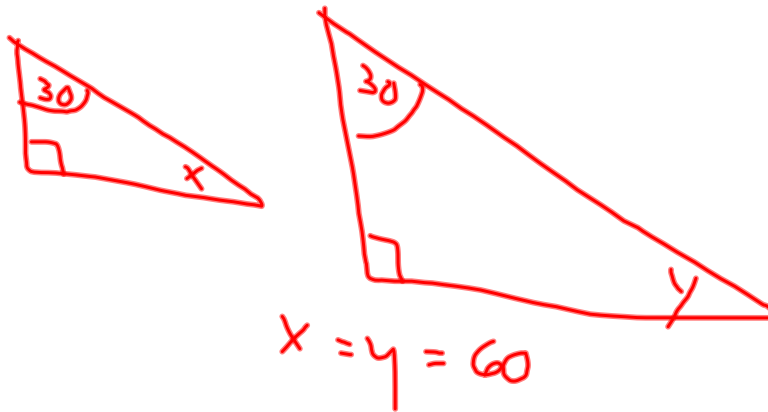
Nov 14-9:58 AM

Example



Nov 14-9:59 AM

Theorem 4.2—3rd Angle Theorem—If 2 angles of 1 triangle are \cong to 2 angles of another triangle, then the 3rd angles are \cong .



Nov 14-10:00 AM

What is $\angle 4$ = to 180?



$$m\angle 4 + m\angle 2 = 180$$

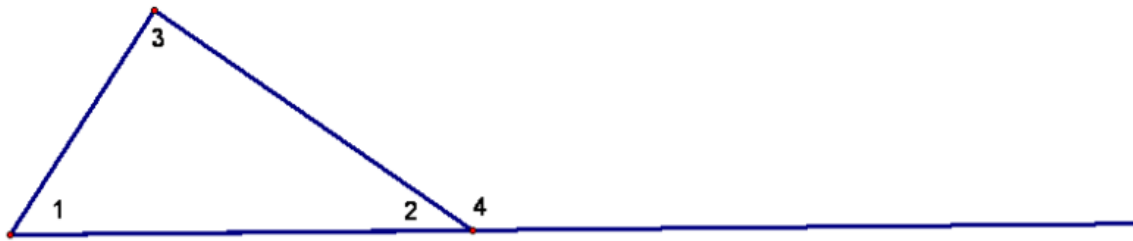
$$m\angle 1 + m\angle 2 + m\angle 3 = 180$$

$$m\angle 4 + \cancel{m\angle 2} = m\angle 1 + \cancel{m\angle 2} + m\angle 3$$

$$m\angle 4 = m\angle 1 + m\angle 3$$

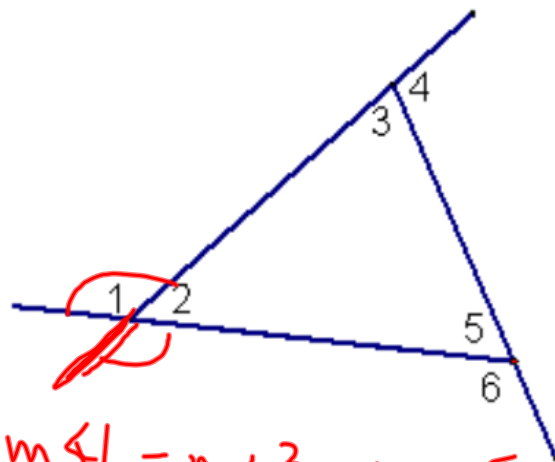
Nov 14-10:00 AM

Theorem 4.3—Exterior Angle Theorem—The measure of an exterior angle of a triangle = the



$$m\angle 1 + m\angle 3 = m\angle 4$$

Nov 14-10:01 AM



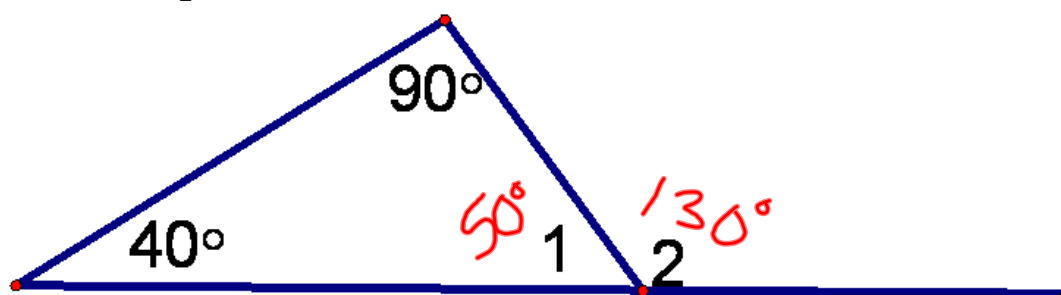
$$m\angle 4 = m\angle 3 + m\angle 5$$

$$m\angle 6 = m\angle 2 + m\angle 3$$

$$m\angle 4 = m\angle 2 + m\angle 5$$

Nov 14-2:25 PM

Example



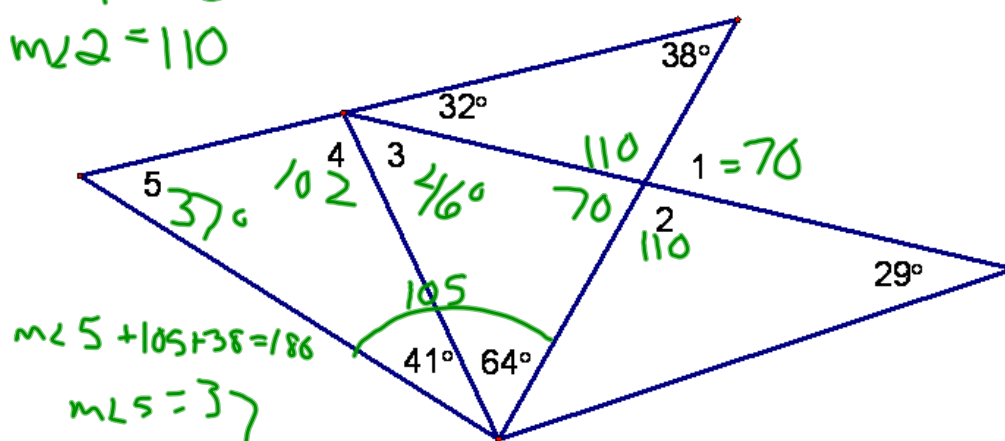
$$m\angle 2 = 90 + 40 = 130$$

Nov 14-10:02 AM

Find the measures of the numbered angles.

$$m\angle 1 = 70$$

$$m\angle 2 = 110$$



$$m\angle 5 + 105 + 38 = 186$$

$$m\angle 5 = 37$$

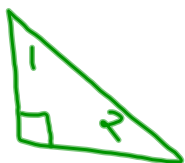
$$m\angle 4 + 37 + 41 + 100$$

$$m\angle 4 = 102$$

Nov 14-10:03 AM

Corollary- Statement that can be easily proven

Corollary 4.1—The acute angles of a right triangle are complementary



$$m\angle 1 + m\angle 2 = 90$$

Nov 14-10:03 AM

Corollary 4.2—There can be at most one right or one obtuse angle in a triangle

Nov 14-10:04 AM

Homework

- p. 180-182 #s 7, 9-11, 33,35
- p. 189-190 #s 11, 12, 15-23,
33-38



Nov 14-10:04 AM